Mr. Hewitson, in his list of Lepidoptera collected by Mr. Wallace (Proc. Linn. Soc. viii. pp. 143–149, 1863) has included several different forms as synonyms of *C. Leda*; but, as I have not seen types of these insects, I am unable to determine whether or not they are really distinct. I think *C. Suyndana* may very likely belong to this series, although the colouring of the upperside appears somewhat different.

XIV.—*On the Contractile Substance and Intimate Structure of the* Campanulariæ, Sertulariæ, *and* Hydridæ. By Professor Reichert *.

1. In the *Campanulariæ* and *Sertulariæ*, as also in other zoophytes, we may distinguish, with Allman, two parts:—the true polypes or polype-heads in the asexual or sexual stage of development; and the bearer of these polype-heads, the *cœnosarc* of Allman, the *substance commune* of Van Beneden, and the *cœnenchyma* of later authors. The bearer of the polype-heads is a young state of these animals, from which the so-called polypes or polype-heads are produced by gemmation; it may be more suitably named the "polype-stem" (*polypophyton*).

2. In the *Campanulariæ* and *Sertulariæ* examined by me, the polype-stem is always divided into a section serving for the attachment of the polypidom, which constitutes the roots, stolons or "rootstock," and the simple or ramified "stalk," which bears the polypes directly either at its extremities or attached to its walls.

3. On the polype-heads we find, as previously recognized distinguishable parts, the mouth-piece (*trompe buccale* of Van Beneden) and the stomach (*estomac* of Van Beneden; *post-buccal cavity*, Allman; *cavité post-buccale*, Milne-Edwards), with the tentacular apparatus. In the asexual polype-heads of the *Campanulariæ* and *Sertulariæ*, the "transition-piece" from the stomach to the stalk must also be particularly indicated. In the *Campanulariæ* and *Sertulariæ* this is situated in the bottom of the bell or cell of the polyparium. In general this division of the bell is separated from the other parts, sometimes externally, but more frequently on the inner surface, by an annular or semicircular projection; so that the "transition-piece" is placed in a more or less dissepimented cavity of the cell.

Lister has called the annular process in the *Campanulariæ* the diaphragm or the septum. Besides these, two other narrowed places are perceptible, situated between the three divi-

* Translated by W. S. Dallas, F.L.S., from the 'Monatsbericht der Akademie der Wissenschaften zu Berlin,' July 1866, pp. 504–509.

sions, of which that introduced between the mouth-piece and the stomach may be called the "œsophageal passage" (*Schlundenge*), and that between the stomach and transition-piece, in the orifice of the so-called diaphragm, the "portal passage" (*Pförtnerenge*). In many genera belonging to this group the stalk bears the secondary heads*, particularly characterized by their urticating organs, most frequently in the vicinity of the polype-heads, apparently as appendages of the latter.

4. In the *Hydridæ* the stomach passes, without any distinctly limited transition-piece, into the polype-stem or foot; the "portal passage" also is not marked externally, but may be recognized during the closure of the stomachal cavity from that of the foot. The *Hydridæ* are further distinguished from the *Campanulariæ* and *Sertulariæ* by the fact that the former are naked and possess no polyparium, and particularly by the structure of the tentacles.

5. The *Campanulariæ*, *Sertulariæ*, and *Hydridæ* are admitted on all hands to consist in all their parts, excepting the arms, of two chief constituents or layers, the ectoderm and endoderm of Allman. Between these two principal layers a third accessory constituent, named by me the "supporting lamella" or "supporting membrane," a sort of inner skeleton, is everywhere introduced. This has already been conjecturally established by Leydig and Kölliker (*basement membrane*). Allman has regarded the supporting lamella as a muscular fibrous layer.

6. In the developed state the ectoderm does not consist of cells; it is not an epithelium as is generally supposed, but is the essential and sole contractile substance of the polypes, comparable to that of the Polythalamia; it contains imbedded in it the urticating organs and sometimes also pigment-corpuscles, but otherwise not the least trace of nuclei or of any cell-constituent. The contractile substance itself is perfectly transparent and of perfectly uniform homogeneous texture, as in the Polythalamia. It acquires the aspect of a cellular structure only during certain states of contraction, especially the papillar condition.

7. During the transition of the cortical layer from the state of rest to that of so-called active contraction, there appear upon any part of its outer surface small knots, warts, papilliform projections, and ridges of variable number and size. The ridges are regularly transverse in direction, embracing the cavity more or less completely. Such annular ridges are formed, however, only on the very mobile parts of the body, but therefore all over the *Hydridæ*. In *Hydra* the head and foot may in this way acquire a very regularly ringed appearance. The papillæ of con-

* *Nematophores* of Busk.

traction also sometimes appear very regularly distributed, and thus cause the polyhedric epithelial marking, as the nuclei of which scattered and covered urticating organs have been indicated.

8. The papilliform processes may become elongated into actual root like feet, which, in most cases, are employed for the attachment of the body. In *Hydra* such root-like feet have been observed on the margin of the pedal disk; in the *Campanulariæ* and *Sertulariæ* they rather occur isolated on the stem, but more frequently and often in larger numbers on the "transition-piece." The root-like feet here adhere by means of a disciform dilatation to the polyparium, and have been more or less distinctly indicated as supposed stable bands in the figures of previous authors. In the *Hydridæ* such root-like feet of filamentous form are developed in greater number also on the inner surface of the contractile layer, and attach themselves firmly to the supporting lamella. These are the muscular fibres of the *Hydridæ* mentioned by Kölliker. Filiform pseudopodia with the so-called granular movement were not observed.

9. The second principal constituent of the body-wall, the endoderm, consists throughout of a simple layer of cells, which is for the most part spread out like an epithelium and provided with cilia. The form of the cells varies according to the state of contraction of the true contractile layer. In the extended state the cells are rather flattened, and in *Hydra* even frequently drawn out in the direction of the longitudinal axis; in proportion as abbreviation takes place their thickness increases, and the cellular layer finally acquires the aspect of a cylinder-epithelium. It is not demonstrated, even in *Hydra*, that these cells can change their form by their own contraction; indeed this is even highly improbable. The inner surface of this cellular layer is turned quite freely towards the cavity, which is filled with nutritive fluid containing granules. Any pigment-granules that may be present are situated within the cells, and never form a separate layer (Agassiz).

10. The supporting lamella consists of a limpid, textureless, soft, elastic substance, which, at ordinary temperatures, only swells up a little in solution of potash, or even in chemically pure sulphuric acid, and does not dissolve even when treated for half an hour with the above-mentioned reagents. The supporting lamella must be regarded as an excretion of the contractile substance, as, in *Hydra*, it occurs even in the free terminal portions of the tentacles, where the inner cellular layer is deficient. Consequently the contractile layer, both on its outer and inner surfaces, forms excretions which gradually become solid, for its own protection and support. In the *Campanulariæ* and *Sertulariæ* the external excretion forms the polyparium, and

the internal one the supporting lamella; in the *Hydridæ* the supporting lamella alone is formed; in other cases (*Gromia* &c.) only an outer skeleton makes its appearance.

11. The tentacles of the *Hydridæ* are simple tubes, the cavity of which is in open communication with that of the stomach; the granular nutritive fluid moves through the tentacles as well as through the cavities of the head and foot. From the morphological nature of the wall of the tube, two divisions must be distinguished in its length, namely, the attached and the free terminal division. On the former the wall is composed of the same constituents as on the head and, especially, on the foot; in the free division the inner, cellular layer is wanting. In the tentacles of the *Campanulariæ* and *Sertulariæ* the inner, cellular layer is also wanting, and, indeed, throughout their whole length. But from the supporting lamella septa are given off at regular intervals, dividing the cavity of the tentacles into chambers, which probably communicate with each other by a central orifice in the septum. In the fully developed state of the animal these chambers contain no cells, neither cartilage nor epithelial cells. In each chamber the contractile axial substance described by me is situated; this is of exactly the same nature as the external contractile layer, only wanting the urticating organs. In the abbreviated state the contractile axial substance fills each chamber almost completely; in a more or less extended state the chambers are filled from the stomachal cavity with a fluid which never contains granules, and appears to be clear sea-water. The contractile axial substance then occupies the axis of each chamber, extending from one septum to the other: its form differs according to the state of contraction; on the septa it spreads out like a disk, perhaps by means of processes; it often presents the form of a ramified cell. Like the outer, contractile layer, this axial substance presents no trace of a cell-nucleus. Knot-like inflations, or urticating organs, placed in front or behind in the *outer*, contractile layer, may produce the illusive appearance of a cell-nucleus.

12. The movement of the nutritive fluid takes place quite independently of any cilia that may be present on the inner, cellular layer, merely by the agency of the contractions of the outer, contractile layer.

13. The comparison of the hollow body of the Hydrozoa to the first traces or stages of development of the organism of the higher Vertebrata undertaken by Huxley and afterwards by Kölliker, has no foundation in fact; it even proceeds from erroneous suppositions, both as to the nature and signification of the first foundation of the vertebrate animal, and with regard to the structure of the body of the Hydrozoon.

14. As both the outer skeleton (*polyparium*) and the inner

skeleton or supporting lamella of the *Sertulariæ*, *Campanulariæ*, and *Hydridæ* must be regarded as hardened excretions of the contractile layer of the Hydrozoon-body, their comparison to structures formed of connective tissue is inadmissible (Kölliker).

XV.—*On the* Antilocapridæ. By P. L. Sclater, F.R.S. &c.

To the Editors of the Annals and Magazine of Natural History.

Gentlemen,

It is very good of Dr. Gray to put me right concerning the absence of the "false hoofs" in some of the smaller Antilopean forms, such as *Nesotragus*, *Nanotragus*, and some species of *Calotragus*, which I had quite overlooked. These organs are stated, and, I believe, correctly, to be also deficient in the Pallah (*Antilope melampus*).

I did not, however, *make a "useless synonym"* in changing Sundevall's name *Digitigrada* into *Phalangigrada*, but merely followed M. Alphonse Milne-Edwards (Ann. Sc. Nat. sér. 5. vol. ii. article on the "*Chevrotains*") in applying the latter term (which in some respects is preferable to the former one) to the Camelidæ.

I may add that I cannot agree with Dr. Gray in considering the genera *Tragulus* and *Moschus* to be "nearly allied." M. Alphonse Milne-Edwards, in the memoir above referred to, has, in my opinion, clearly shown them to be very different, *Moschus* being affine to the Cervidæ, while *Tragulus* and *Hyomoschus* constitute a distinct family of Artiodactyles, leading off towards the non-ruminating Suidæ. It is well remarked by M. A. Milne-Edwards that, if an isolated foot of *Hyomoschus* had been found fossil, it would certainly have been referred to an animal allied to the Peccaries (*Dicotyles*).

Nor can I agree with Dr. Gray in "doubting the applicability of placental characters to zoological classification." After the labours of Von Baer, Carus, Kölliker, Milne-Edwards, Huxley, and Rolleston upon this subject, I can no longer doubt that, in the words of the last author*, "the modifications of the placental structures form a very safe basis for zoological classification;" and I believe that I am by no means singular in this opinion.

I am, Gentlemen,

Yours, &c.,

P. L. Sclater.

11 Hanover Square.
Dec. 13, 1866.

* Trans. Zool. Soc. v. p. 311.